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EXAMINER	
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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/646,680
Filing Date: November 04, 2000
Appellant(s): YAMANAKA ET AL.

Ronald P. Kananen
For Appellant

EXAMINER'S ANSWER

MAILED
AUG 24 2004
GROUP 1700

This is in response to the appeal brief filed April 15, 2004.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences that will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

The rejection of claims 1-2, 16-17, and 20 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7).

The rejection of claims 8-9 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7).

Claim 14 stands or falls alone, as indicated by applicant.

Claim 21 stands or falls alone, as indicated by applicant.

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

4,961,958	Desphandey et al.	10-1990
5,900,161	Doi	05-1999
5,464,499	Moslehi et al.	11-1995
3,769,670	Schrank	11-1973

(10) Grounds of Rejection

The following grounds of rejection are applicable to the appealed claims:

Claims 1, 2, 16, 17, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Desphandey et al. (US 4,961,958).

Desphandey teaches a process where resistance heats a tungsten filament in order to thermally decompose a reactant gas (column 5, lines 43-49). A dc voltage of 80 volts may be used to accelerate electrons towards an anode, which directs the reactive species towards the base (column 5, lines 49-54). Examiner interprets 80 volts to be below "a glow discharge starting voltage", since the applicant has cited examples where a value of 500 volts is used and is below "a glow discharge starting voltage" (page 44, line 8, of specification). Additionally, the reference teaches higher voltages

may be used by using an RF plasma, indicating that the 80 volts is not of sufficient strength to be above the glow discharge starting voltage by comparison. As the electric field causes acceleration, this reads on providing kinetic energy. Additionally, since the voltage is used for acceleration and not for causing a glow discharge, one of ordinary skill would interpret this voltage to be less than the glow discharge starting voltage. The filament may be heated to 1000 degrees Celsius (column 6, line 34). The substrate temperatures taught are within the applicant's claimed range (column 5, lines 5-15).

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Desphandey et al. (US 4,961,958), as applied to claim 1 above, and further in view of Doi (US 5,900,161).

Desphandey teaches the limitations of claim 1, but fails to teach process of cleaning the deposition chamber after the coated substrate has been taken out. However, Doi teaches a plasma, self-cleaning technique where fluorine radicals are produced by an electric-discharge plasma (column 1, lines 45-51). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to remove the substrate of Desphandey from the deposition chamber and then generate a plasma discharge from the electrodes with the proper feed gas being supplied. By doing so, the apparatus of Desphandey is self-cleaning.

Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Desphandey et al. (US 4,961,958), as applied to claim 1 above, and further in view of Doi (US 5,900,161) and Moslehi et al. (US 5,464,499).

Desphandey teaches the limitations of claim 1, but fails to teach the gas distribution means as being an electrode. However, it has been shown above that it would have been obvious to use the plasma producing method of Doi in order to have the apparatus of Desphandey be self-cleaning. Additionally, Moslehi teaches a multi-electrode system that has the benefits of being able to selectively switch between processing a substrate and self-cleaning the chamber (column 3, lines 4-13). Other benefits include real-time control of the process (column 3, lines 14-20). Therefore, it would have been obvious to use such an electrode arrangement in the method of Desphandey. By doing so, the process is capable of being able to selectively switch between processing a substrate and self-cleaning the chamber, as suggested by Doi, and the user has real-time control of the process. By having the showerhead be an electrode, as taught in column 4, lines 33-62, the configuration of claims 8 and 9 are read upon.

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Desphandey et al. (US 4,961,958), as applied to claim 1 above, and further in view of Schrank (US 3,769,670).

Desphandey teaches the limitations of claim 1, but fails to teach that the tungsten is heated in a hydrogen-based atmosphere before supplying the material gas.

However, Schrank teaches that because tungsten readily oxidizes when heated, it is necessary to use reducing atmospheres, such as hydrogen, when heating (column 1, lines 15-20). This reference further teaches that hydrogen bromide is preferred as the atmosphere gas when heating tungsten to temperatures of about 1500 degrees Celsius (column 1, lines 35-42). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to heat the tungsten in Desphandey in a hydrogen bromide atmosphere prior to introducing the material gases. By doing so, oxidation of the tungsten would be reduced or prevented. Examiner interprets hydrogen bromide gas to be a hydrogen-based gas.

(11) Response to Argument

Information Disclosure Statement

Applicant requests that the references of Desphandey and Moslehi be formally made of record in the present application, as no PTO-892 was received in the previous Office Action, in which these two references were relied upon. It is noted that a PTO-892 that included these two references was included in the previous Office Action and was officially made of record on June 3, 2003. It appears that the applicant did not receive a copy of this form. A copy of the original form was faxed to the applicant on July 13, 2004, see the interview summary of July 13, 2004.

Petition

Applicant requests a decision on the petitions filed. According to the record, a decision on the first petition was mailed on November 27, 2002 and a decision on the second petition was mailed on November 13, 2003.

Arguments pertaining to claim 1, which stands or falls with claims 2, 16, 17, and 20

Claim 1 has been rejected under 35 U.S.C. 102, as being anticipated by Desphandey. Applicant argues, "an electric field of not higher than a glow discharge starting voltage is caused to act upon the produced reactive species is not found within Desphandey". In support, the applicant alleges that the examiners interpretation of 80 volts being below the glow discharge starting voltage fails because the gases of Desphandey are different from those of the application. Applicant further argues that in the present invention, no plasma is generated and this differs from Desphandey. These arguments are not found persuasive.

The examiner notes that the claims do not exclude plasma being produced. Specifically the claim recites, "an electric field of not higher than a glow discharge starting voltage is caused to act on the reactive species". Thus, the claim only requires an electric field that is not higher than "**a** glow discharge starting voltage" (emphasis added), not an electric field that is lower than the glow discharge starting voltage **of the reactants at the process temperature and pressure.** Thus, as long as the voltage is less than or equal to a glow discharge starting voltage, the voltage reads on the applicant's claim. The 80 V taught by the reference is less than the 500 V taught by the

applicant page 44, line 8, of the specification, which is taught to be less than "a glow discharge starting voltage". Thus, 80 V must also be below "a glow discharge starting voltage". The alleged differences in reactants between the present invention and Desphandey is moot, as "a glow discharge starting voltage" is open to any glow discharge starting voltage and the applicant's claims do not have any limitations drawn to the reactants.

Additionally, any voltage that would cause a glow discharge to start would be considered "a glow discharge starting voltage". The claims require that the voltage be "not higher than a glow discharge starting voltage", not that the voltage be less than the **minimum** voltage required to initiate a glow discharge. Thus, even if the voltage caused a glow discharge, this voltage would be equal to, and not higher than, "a glow discharge starting voltage". Therefore, any voltage used for the electric field would inherently be considered "not higher than a glow discharge starting voltage".

Additionally, the examiner points to column 5, lines 49-54, in which Desphandey teaches that voltages higher than 80 V may be used by using an RF plasma. This indicates that 80 V is not of sufficient strength to initiate a glow discharge in the particular reactants. Furthermore, the electric field is used to cause acceleration of electrons and not to create plasma. This would indicate to one of ordinary skill in the art that the voltage is at least less than the glow discharge starting voltage the reactants.

Arguments pertaining to claim 14

Applicant argues that there is no motivation to combine the teachings of Desphandey and Doi. In support, the applicant argues that there is no teaching that the apparatus of Doi is suitable for performing the process of Desphandey. This argument is not found convincing. The examiner does not suggest using the apparatus of Doi in the process taught by Desphandey, as the applicant seems to argue. The examiner only suggests that it would have been obvious at the time the invention was made to a person having ordinary skill in the art to incorporate the cleaning cycle of Doi in the process and apparatus all ready taught by Desphandey, the primary reference, as is indicated in the motivation-to-combine statement ("By doing so..."). One skilled in the art would certainly know how to generate fluorine radicals in the apparatus of Desphandey. The motivation to do so is that the apparatus of Desphandey is made self-cleaning.

Arguments pertaining to claims 8 and 9, which stand or fall together

Applicant argues that the references fail to teach having the catalyzer be located between the base and an electrode. The applicant only addresses how Desphandey fails to teach this limitation and does not argue how the proposed combination fails to teach this limitation. Applicant's arguments are not found convincing. By having the showerhead be an electrode, as taught by Moslehi in column 4, lines 33-62, the configuration of claims 8 and 9 are read upon. As set forth in the rejection, motivation to use the electrode configuration taught by Moslehi in the process taught by Desphandey would be the capability of being able to selectively switch between processing a

substrate and self-cleaning the chamber, as suggested by Doi, and the user has real-time control of the process.

Arguments pertaining to claim 21

Applicant argues that Schrank is non-analogous art. This is not found convincing. In response, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Schrank teaches a method of preventing oxidation when heating a tungsten filament. Since the present invention uses a heated filament of tungsten, Schrank is reasonably pertinent to the particular problem the applicant is concerned with.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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July 13, 2004

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